

## **MXMCRYO** SUSTAINABLE SOLUTION FOR YOUR PRODUCTION PROCESSES

### MIRAI XM CRYO 20

(MXM CRYO 20) PRODUCT DATASHEET

### • ZERO GWP

With the air cycle technology Not a subject of F-Gas Regulation

### • THE WIDEST TEMPERATURE RANGE

From -120 °C to +80 °C\* Accuracy ±0.5 °C under changing load Accuracy ±0.02 °C after reaching setpoint

### EASY CONNECTIVITY

Plug & Play system, configurable connections

COMPACT AND NARROW DESIGN

### FAST RETURN OF INVESTMENT

\* The temperature range varies based on the type of HTF selected and will be confirmed during the ordering process.





# **MIRAIX CRYO**

### MIRAI XM CRYO 20 PRODUCT DATASHEET

### **FEATURES**

MIRAI XM CRYO machines are ideal solution for the applications that need compact but powerful refrigeration solution.

In addition to safe and environmentally friendly cooling, it represents the latest solution in technology, providing highly-precise temperature and process control covering dramatic changes in temperature and machine load.



**AIR AS REFRIGERANT** 0 GWP. 0 ODP. and 0 TFA Environmentally friendly Refrigerant free of charge

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**TEMPERATURE ACCURACY** ± 0.5°C under changing load ±0.02 °C after reaching setpoint

**QUICK SWITCHING BETWEEN COOLING AND HEATING MODES** From +40°C to -100°C - within 2 min

VARIOUS INDUSTRY APPLICATIONS Suitable for a wide range of application , EIII from industrial processes to storage



#### **PLUG & PLAY SOLUTION**

MXM CRYO

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**ENERGY EFFICIENCY** High cycle efficiency Inverter driven motor



**NO VIBRATION** Turbo-compressor design eliminates vibration



Long equipment lifecycle Low maintenance

LOW OPERATING COSTS



MACHINE WHEELS For convenient transport machine in production



The **MIRAI XM CRYO** machine is the ideal solution for retrofitting in existing installation and is easy to implement in new projects due to its Plug & Play design, compatible with multiple industry standard connection types. The MIRAI XM CRYO's compact design makes it perfect for industries requiring a small but powerful machine.





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HEAT TRANSFER FLUID (HTF) CONNECTION

#### WWW.MIRAI-INTEX.COM

### MIRAIXCRYO

### TESTS

The following section focuses on the various tests of the **MIRAI XM CRYO 20** machine, which are very important and decisive for use in various applications in different markets. Temperature accuracy and machine control are very important aspects in selecting the right machine for production.

#### **PROCESS CONTROL ACCURACY TEST**

This screenshot from the machine's control system screen shows the results of a heat-up and cool-down process with high-precision temperature control, at 10 °C intervals every 20 minutes. This screenshot demonstrates that the temperature control accuracy of the **MIRAI XM CRYO 20** is very precise.



#### **CHANGING LOAD TEST**

This test focuses on temperature maintenance when the heat load on the machine is changing. Specifically in this case, the test was conducted at a change from 0 kW to 7 kW. The results showed that **temperature control under** changing load is ± 0.5 °C. 14:24:00 15:36:00 16:48:00 18:00:00 19:12:00 20:24:00

Above the graph is the time interval when the test started and ended, how long the loads were measured for.

The mark [\*] indicates the location where the temperature change was measured.



### **COOLING CAPACITY**

Cooling capacity of the **MIRAI XM CRYO 20** over a temperature range of -40 °C to -120 °C. At cooling water temperature +10 °C.



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### **SPECIFICATIONS**

Performance is nominal and individual units may vary. The efficiency of each refrigeration unit will depend on the specific operating conditions.

TECHNICAL DATA	MIRAI XM CRYO 20		
Cooling method	Air cycle		
Heating method	Electrical heater		
Temperature range *1	-120+80 °C		
Rated motor power (kW)	20		
Compressor	Mirai Turbo-compressor		
Refrigerant	Natural air (R729)		
Nominal cooling capacity	7.7*2		
Temperature accuracy under changing load	±0.5 °C		
Temperature accuracy after reaching setpoint	±0.02 °C		
HTF PARAMETERS			
HTF tank volume, l	Various options on customer request		
Inlet pressure (bar)*3	On customer request		
Max outlet pressure (bar)*1	10		
Nominal/maximum allowed pressure drop (bar)*1	0.2/10		
Min HTF flow (l/min)	Depending on customer process*3*4		
Nominal HTF flow (I/min) *1*2	29		
Max HTF flow (l/min)	72		
HTF connection	3/4" NPT		
WATER COOLING			
Water connection	1" NPT (Other on request)		
Nominal pressure drop, bar	1		
Max allowed pressure on water inlet, bar	10		
Cooling water temperature range on inlet	+6+30 °C (other on request)		
Mass flow min (kg/h)	4000		
Mass flow nominal (kg/h) <sup>*2</sup>	5000		
Mass flow max (kg/h)	6000		
Water quality	See specification <sup>*5</sup>		
GENERAL TECHNICAL SPECIFICATION			
Safety protection	High pressure protection, water supply cut-off protection, over-current protection, high temperature protection, sensor failure protection, heater protection		
Sound pressure, at a distance of 1m from <u>CM (</u> dB)	up to 70		
Control system	KEB system compatible with digital communication protocols ProfiNET, EtherCAT, EtherNET/IP, and Powerlink. Another protocols by request		
POWER REQUIREMENTS			
Power supply	~3 PE+N/3PE, 400VAC / 440VAC / 480VAC, 50/60Hz		
Total consumption (kW)	34		
Max air cycle core consumption (kW)	22		
Heater power, (kW)	9		
Pump power (kW)	2.2		
Main circuit breaker	60A@400VAC, 60A@440VAC, 50A@480VAC		
DIMENSIONS	•		
Dimensions (WxDxH)	600x1600x1787 mm		
Weight (kg)	950 (can vary depending on options)		
OTHER REQUIREMENTS			
Air/nitrogen requirements	6-10bar, -80 °C pdp, 201pm <sup>*6</sup>		
Installation room requirements	+5+35 °C, RH 10-80% no condensation, altitude up to 1000m		
*1 - depending on the HTF used.			

\*2 - HTF - Fragoltherm X-T9-A, HTF setpoint -80 °C, HTF volume flow 29 l/min, water temperature +10 °C, water/glycol composition – pure water, direct connection heat load to machine, pressure drop on heat load <20kPa.

\*3 – If customer equipment located above machine inlet/outlet - flow throttling on machine inlet is required to provide positive pressure on customer side. In case of throttling without regulation - minimum HTF flow calculated according to required pressure drop.

\*4 – actual minimum value dependent on allowed temperature difference and cooling/heating capacity.

\*5- The water should contain a corrosion inhibitor that protects aluminum alloys and copper in the concentration recommended by the manufacturer (for detailed information contact MIRAI INTEX.)

\*6 - For more information contact MIRAI INTEX.

**CM** - Cooling machine

# MIRAIXCRYO

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11. Emergency stop button

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